DOCUMENT RESUME

ED 249 101 SE 045 115

TITLE	The Interesting World of Insects. A Fall Activity Packet for First Grade.
INSTITUTION	Jackson Community Coll., MI. Dahlem Environmental Education Center.
SPONS AGENCY	Department of Education, Washington, DC. Inst. of Museum Services.
PUB DATE	83
GRANT	G008103172
NOTE	36p.
AVAILABLE FROM	Dahlem Environmental Education Center, Jackson Community College, 7117 South Jackson Rd., Jackson, MI 49201.
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Animal Behavior; *Animals; *Elementary School Science; *Entomology; *Environmental Education; *Field Trips; Grade 1; Interdisciplinary Approach; Learning Activities; Outdoor Activities; Primary Education; *Science Activities

ABSTRACT

This instructional packet is one of 14 school environmental education programs developed for use in the classroom and at the Dahlem Environmental Education Center (DEEC) of the Jackson Community College (Michigan). Provided in the packet are pre-trip activities, field trip activities, and post-trip activities which focus on the characteristics and behavior of insects. Strategies for using these activities with first grade students are also provided. The four pre-trip activities focus on insect anatomy, insect life cycles, and the roles insects play. Four activity sheets and a letter to parents explaining the purpose of the program are included. The eight post-trip activities provide students with such experiences as making an insect net, using a classification key, and making insect "motels." Additional activities are also suggested. A list of formal and non-formal objectives and instructions for both indoor and outdoor field trip activities at the DEEC are provided in a separate field trip guide. (JN)

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"Interesting World of Insects" is one of fourteen school environmental education programs developed by the Dahlem Environmental Education Center of the Jackson Community College. Assistance for the project was provided by the Institute of Museum Services Special Projects Grant #G008103172, of the U.S. Department of Education.

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The Interesting World of Insects

A Fall Activity Packet for First Grade

Insects make up the largest group of animals in the world. Their great diversity and high reproduction rate have helped them successfully populate almost every place you can imagine. They inhabit deserts, ponds, and rotten logs as well as mountains, streams, and leafy tree tops. Because these fascinating creatures live all around us, they are easy to study.

"The Interesting World of Insects" teaches first graders about insects -- their characteristics, life cycles, homes, names, and roles. Based upon nationally accepted first grade science objectives, the program emphasizes observation and classroom skills. It also encourages your students to work together to collect insects and complete art projects.

This packet contains pre-trip activities which will introduce your class to insects. Discussion, art project, and handout ideas are included to help you prepare your students for their field trip to the Dahlem Environmental Education Center.

The field trip will begin with an indoor review of insect life cycles and body parts. Afterwards, equipped with insect nets and magnifiers, your students will venture outdoors in search of prize catches.

Also included in this packet are post-trip activities which will help extend your insect study after you and your students return to school. There are instructions for collecting, caring for, and learning about the insects which live around your home and school.

"The Interesting World of Insects" will help your class develop a respect for insects. Your students can demonstrate their respect by watching these fascinating creatures instead of squashing them. In the years to come your students' interest may blossom into a concern for other aspects of the environment and motivate them to act in an environmentally responsible manner.

To enter the "Interesting World of Insects," just turn this page!

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Goals and Objectives

Program Goal

First graders will become more aware of insects and their characteristics.

Program Objectives

Students will:

-distinguish insects from other animals by pointing out their body parts.

-learn the life cycle stages of insects by making models and correctly sequencing them.

-demonstrate cooperation by doing insect-related class projects.

-appreciate the value of insects by stating ways insects are beneficial and harmful to living things.

-demonstrate responsibility by caring for insects and releasing them after a short captivity.

-learn more about insects by discovering them in the natural and built environments.

-demonstrate the correct use of an insect net by using one to catch insects.

-express themselves creatively by doing insect-related projects.

-discriminate among different types of insects by pointing out their distinguishing characteristics.

-demonstrate respect for insects by observing rather than killing them.

Pre-Trip Activities

The four activities in this section are guaranteed to drive your students buggy! But that's okay -- the activities will also introduce your students to "The Interesting World of Insects" and prepare them for their field trip.

1. Pleased to Meet You

Insects are invertebrates. They have hard outer coverings or "suits of armor" to protect their boneless bodies. Insects belong to a special group of invertebrates called arthropods. All arthropods have jointed legs. Here are some clues to help you distinguish insects from other kinds of arthropods.

Typical adult insects have:

- 3 body parts
- 3 pairs of jointed legs
- 2 pairs of wings
- 1 pair of antennae
- both simple and compound eyes.

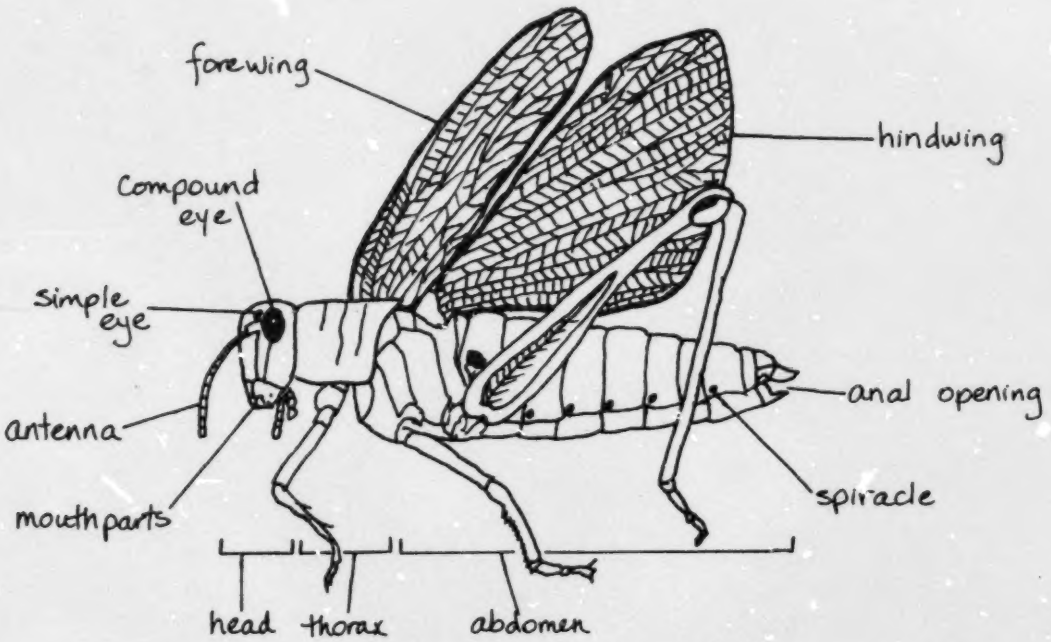
Other arthropods are arachnids, centipedes, millipedes, and crustaceans. Spiders, mites, ticks, chiggers, and scorpions are arachnids. They have two body parts and four pairs of legs but lack wings.

Centipedes have long antennae, long flat bodies, and one pair of legs attached to each body segment. Millipedes have short antennae, long rounded bodies, and two pairs of legs attached to each body segment. Crayfish, shrimp, crabs, and sowbugs are crustaceans. They have at least five pairs of legs.

Duplicate activity sheet 1 so that your students can practice distinguishing insects from other types of arthropods.

2. A Closer Encounter

Once your students can separate insects from other arthropods, they should look at an insect in more detail. Distribute copies of activity sheet 2 and use the following information to explain a grasshopper's anatomy.



An adult insect's body is made up of three parts: the head, thorax, and abdomen.

The head bears the antennae, eyes, and mouthparts. A typical adult insect has one pair of jointed antennae. Besides using its "feelers" for touch, an insect may use them to taste, smell, and hear.

Insects have several eyes -- two large compound eyes and 2-3 simple eyes. The simple eyes help an insect to distinguish light from dark and perhaps to detect crude images at close range. Composed of thousands of hexagonal facets, compound eyes form mosaic images, detect movement, and distinguish various wavelengths of light.

Different types of insects have different diets and therefore, different kinds of mouths. A grasshopper, for example, has chewing mouthparts. A butterfly has siphoning mouthparts and a flea piercing and sucking mouthparts.

An insect's legs and wings are attached to its middle

part or thorax. Legs are used for walking, running, jumping, swimming, grasping, producing sound, and carrying pollen. All adult insects have three pairs of legs, but the number of wings that they possess varies. Most insects are like the grasshopper and have two pairs of wings. Flies possess only one pair. Other insects, like the walkingstick, lack wings altogether.

The third or hind part of an insect is called the abdomen. That is where the insect's genitals and anal opening are located. Insects also have several pairs of breathing holes called spiracles along the sides of their abdomen.

To review the parts of an insect, your students can color and name the parts of their grasshopper. They can also put together the puzzle cut from a mounted copy of activity sheet 3. In addition, each student can create a butterfly out of these supplies: egg cartons, masking tape, toothpicks, scissors, magic markers, construction paper, and pipe cleaners or twist ties.

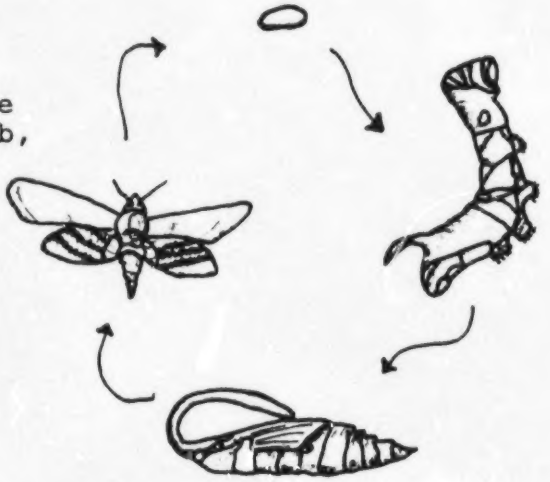
Show your class how to cut and tape three egg carton compartments together to form the body parts of an adult insect. Add antennae, eyes, and coiled, siphoning mouthparts to the head. Attach large colorful wings and jointed legs to the thorax. Voila -- your classroom is alive with beautiful butterflies! Some students may wish to use leftover supplies to make other types of insects as well.

3. Growing Up As An Insect

All insects hatch from eggs. These small eggs are round, oval, conical or football-shaped, and colored, striped, or speckled. After hatching, all insects go through a series of changes. Some insect life cycles have four stages; others have only three. Both cycles are outlined on the next page.

FOUR STAGE LIFE CYCLES

The four stage life cycle includes the egg, larva, pupa, and adult stages. The worm-like larva is sometimes called a grub, caterpillar, or maggot. It spends most of its time eating. The larva makes a pupa case, sometimes called a cocoon or chrysalis. Although the pupa is called the "resting stage," it is really a time of major change. The adult insect will eventually emerge from the pupa case. It will mate, lay eggs, and begin the cycle all over again.

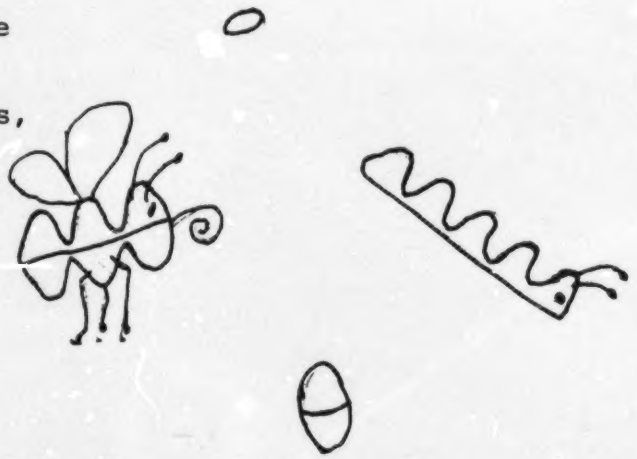


THREE STAGE LIFE CYCLE

This life cycle has three stages: egg, nymph, and adult. An egg hatches into a young insect called a nymph. A nymph resembles its parents, but is smaller and wingless. As a nymph grows, it molts or sheds its outer shell several times. After each molt, the nymph looks more like an adult insect.

Duplicate activity sheet 4. Students should cut the page into cards. Help each student to separate their cards into butterfly and grasshopper piles. Can your students correctly order the life cycle stages in each pile?

Students can fashion eggs, caterpillars, and pupae from the materials left over from the first activity. Egg cartons can be transformed into eggs (tiny bits or hole-punched dots) and pupae (two egg compartments fastened together). Series of compartments can make caterpillars. Students can practice correctly ordering their life cycle creations.



4. Insects and Us

Your class probably agrees that insects are fascinating creatures, but may wonder about the benefits of insects. Because your students' concept of "good" and "bad" probably reflects a human bias, this activity will help broaden their perspective.

After all, just because people regard mosquitoes as "no good" doesn't mean that dragonflies do, too! It all depends upon your point of view. Try to point out that every creature serves some useful function. Perhaps it eats another animal and keeps that population in check. Maybe it provides another creature with food or supports a host.

Help your class make a list of good and bad roles that insects play. Here are a few ideas to get you started.

Good for Us	Bad for Us
•product makers: bees (honey), silk moths (silk), scale insects (cochineal)	•biters: mosquitoes, deer flies, gnats
•pollinators: bees, flies, moths	•stingers: bees, wasps, hornets, yellow jackets
•pest controllers: dragonflies, lady bugs, praying mantis, predatory wasps, ground beetles, robber flies	•crop eaters: grasshoppers, ant, hornworm, gypsy moth, codling moth, potato bug, bean beetles, corn borer
•fish bait and food for birds, mice, snakes, lizards, and people	•disease spreaders: tsetse flies (sleeping sickness); some mosquitoes (yellow fever, encephalitis, and malaria); house flies (typhoid fever)
•scientific study: fruit flies (genetics) and aquatic insects (indicators of water quality)	•house pests: moths, cockroaches, termites, carpet beetles, ants
•decomposers: beetles, ants, termites	•food contaminators: beetles, weevils, moths

For every insect on the "bad" list, challenge your students to think of a reason why another animal regards it as "good."

Vocabulary Words

You and your class can work together to make an insect vocabulary list. You might want to start with these basics:

adult
abdomen
antenna
caterpillar
cocoon
compound eye
egg
head
insect
larva
nymph
pupa
simple eye
thorax

and invite students to add words such as these:

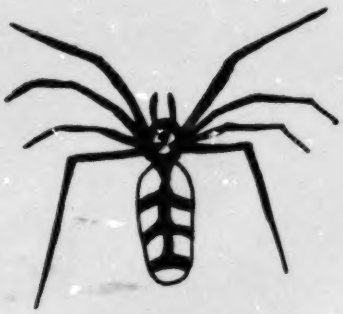
ant
bee
beetle
butterfly
cricket
dragonfly
grasshopper
house fly
ladybug (ladybird beetle)
lightning bug
moth
praying mantis

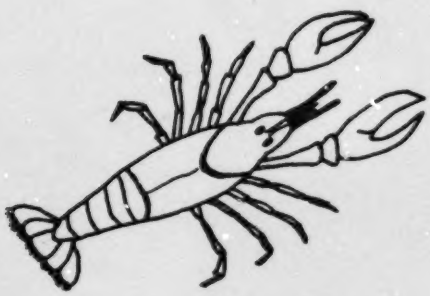
Get your students' parents involved in "The Interesting World of Insects" by sending them a copy of the Parent Letter.

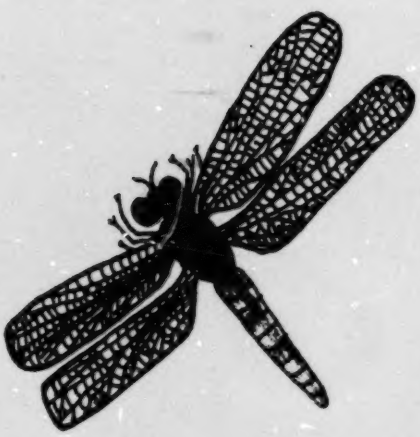
Name_____

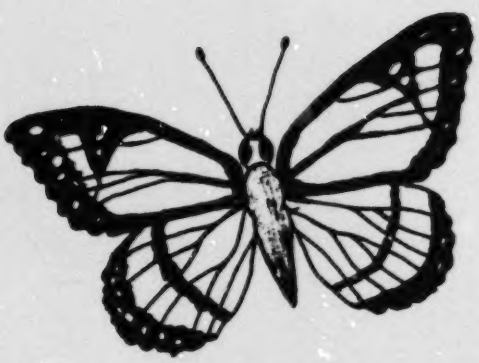
Am I an Insect?

Circle the pictures of the insects below.



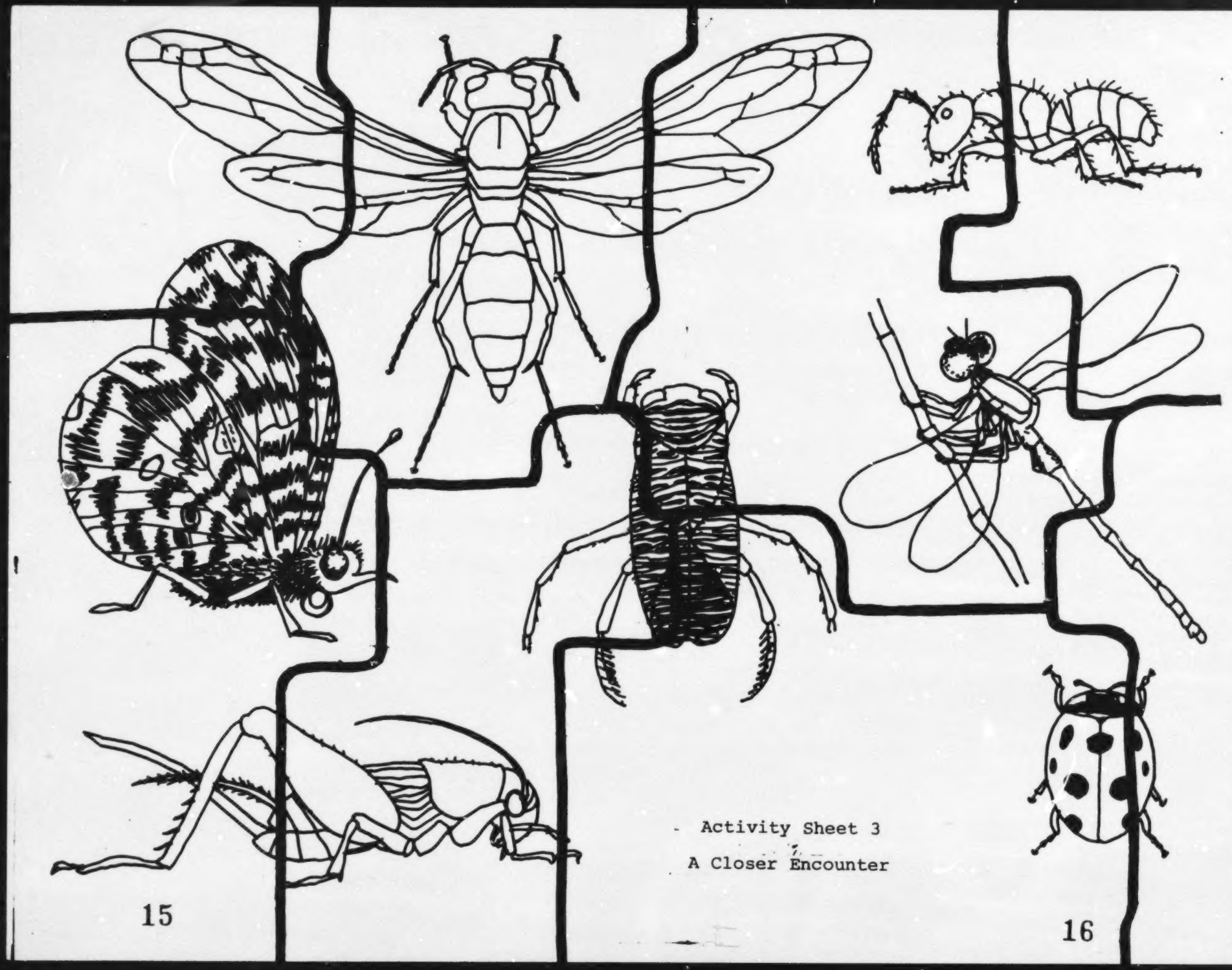






Activity Sheet 1
Pleased to Meet You

Activity Sheet 2
A Closer Encounter

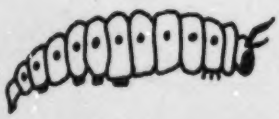


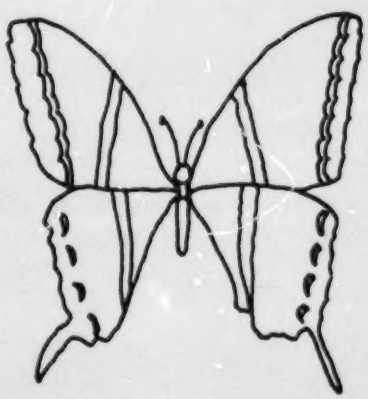
Activity Sheet 3

A Closer Encounter

Insect Life Cycles

Activity Sheet 4
Growing Up As An Insect





Dear Parents:

If your first grader has seemed extraordinarily interested in bugs lately, it's because we are studying insects in school. So far we have learned about insect body parts, their life cycles, and their roles. Soon our class will go on a field trip to the Dahlem Environmental Education Center to learn more about insects and to collect some with nets. Upon our return to school we'll find some insects for the temporary "insect motel" we'll make and do some insect projects.

You can enjoy insects with your first grader by:

- helping him/her make an insect costume for Halloween.
- giving him/her an insect net for a special occasion.
- encouraging your child to overcome any fear or intolerance of insects that s/he might have.
- accompanying him/her on an insect hunt. The basement, garden, garbage cans, and outdoor lights are great places to start!
- asking him/her to tell you what s/he has learned about insects in school and at the Dahlem Center.

On the day of the field trip, listen to the weather report. Please be sure that your child dresses appropriately. Long pants, sturdy shoes, and layered clothing are always recommended.

Sincerely,

First Grade Teacher

Field Trip

By now your students are probably buzzing with excitement about their field trip to the Dahlem Environmental Education Center. Because you've provided such a good introduction to insects, your young entomologists are well-prepared for the trip.

Upon your arrival, you and your class will be met indoors by a trained guide. There you will review insect parts and life cycles and observe the bees in the observation hive. Then, armed with insect nets and magnifiers, you'll proceed outdoors for a grand insect safari. The guides will help your entomologists sort and name their insects. Since the wildlife at the Dahlem Center is protected, all insects will be released at the end of the field trip.

You can make advance arrangements for your students to visit the gift shop at the end of their hike. Bug boxes (small plastic containers with magnifiers for lids) are popular items that sell for less than one dollar. They're great for looking eyeball-to-eyeball at insects. Regular hand lenses are also available for sale.

Please stress with your students the importance of dressing for the weather. Sturdy shoes, long pants, and layered clothes are recommended.

Post-Trip Activities

After their field trip, your students will be interested in exploring the school site and their yards for insects, galls, and other small creatures. Encourage students to look closely -- their observations may lead to great art projects!

1. Insect Motels

Before you go exploring, prepare a safe place to temporarily house your insect catches. Two "motel" designs are included below. By using them, you will be able to observe most insects in your classroom for one to two days. It is difficult to keep insects alive much longer than that because of their special food and habitat requirements. If some insects are too active to observe closely, they can be slowed down by a short "cooling off" period in the refrigerator.

Aquarium Lodge:

- Place sand and dirt along the bottom of an empty aquarium. Find or make a screen top that fits tightly.
- Whenever you collect an insect for the "lodge," pick some nearby leaves to provide food for your insect.
- In order to give your "lodgers" the moisture they need, spray the aquarium occasionally with water.

Caterpillar Inn:

- To construct this cage you will need two aluminum cake pans, a 14" x 26" piece of screen, some plaster-of-Paris, a few dead sticks, and two feet of thin wire or thick thread.
- Turn under the long edges of the screen and overlap the shorter ends to make a tube that fits snugly inside one cake pan. Sew the screen tube together.
- Unfold the lower (already turned under) edge of the screen and set it in one cake pan. Pour plaster-of-Paris mixed with water into the pan. Fill the pan to within an inch the top. As the plaster sets, anchor some

sticks in the center of the cage.

•Once the plaster dries, the "inn" is ready for its first "inn-habitants." Use the second cake pan as a lid.

Many thanks to Jane Weiser of Horton Elementary School for this insect-inn design.

2. Schoolyard Inventory

Take your class outside to survey the school grounds for insects. Remember to take along some collecting jars with holes poked in the lids!

Some students may wish to bring their nets to school. While these students are busy sweep-netting one area of the property, another group can search underneath rocks and logs for crawling insects. Caution this group to return the overturned rocks and logs to their original positions so that the habitats underneath aren't ruined. A third group can lay a sheet of light-colored cloth or canvas around the base of a shrub or small tree and shake the branches. Insects should drop to the cloth where they can be easily picked up.

How many different kinds of insects did the class find? Which type was most common? Which one was the largest? Most colorful? Most interesting?

Your students can either observe and release all their insects while they're still outdoors or they can take a few prized catches inside to the "Insect Motel."

Remind your students to search their homes and yards for insects. The garden, basement, garbage can, and an outdoor light are great places to start!

3. Mystery Insect

There are over a million different kinds of insects in the world. How does one ever begin to learn even some of their names? By close observation, of course!

Prepare your students for this observation-sharpening activity by teaching them the names of some of the boarders at the "Insect Motel." An insect field guide or picture book will help you identify these insects, as will the simple key at the end of the post-trip section. Draw and label pictures of them. Hang the pictures around the room or make them into flashcards. Then secretly place a current motel resident in a jar with holes poked in the lid. Cover the jar with a piece of cloth.

Invite your students to guess the identity of the concealed "Mystery Bug" by asking you "yes " or "no" questions. If your students need help at first, prompt them with questions like these:

- Does it have two pairs of wings?
- Are its antennae long?
- Is it red?
- Does it have stripes?
- Is it larger than my thumbnail?
- Does it crawl?
- Is it an adult?

Once the "Mystery Bug" is correctly identified, uncover the jar and let everyone have a look.

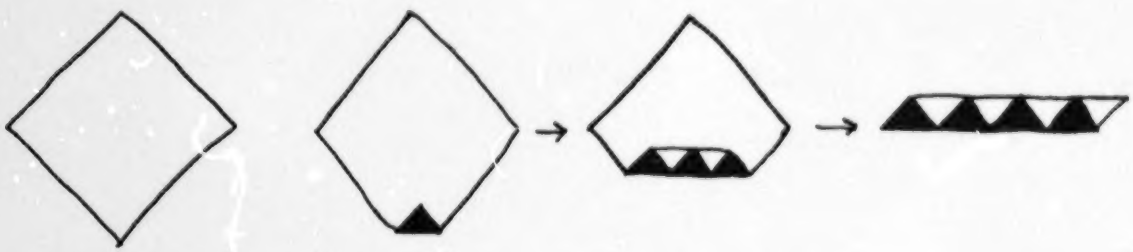
The whole secret to identifying insects is developing good powers of observation. In a higher grade your students will probably learn how to use scientific keys to identify animals, trees, or wildflowers. Help your students to develop the fundamentals now by encouraging them to observe their insect catches closely. Don't forget to play a few more rounds of "Mystery Insect!"

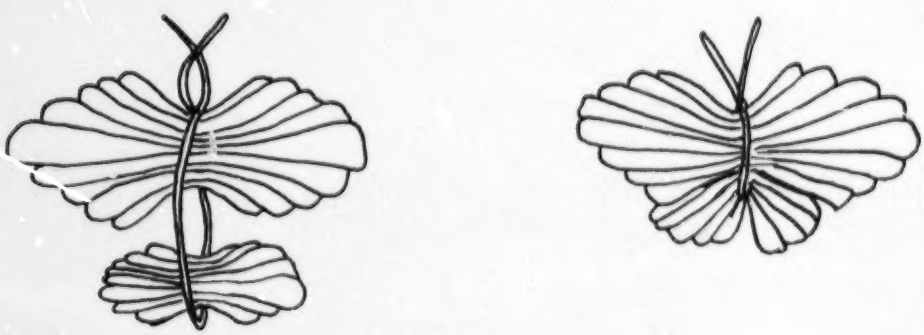
4. Moon Bugs and Butterflies

Bugs come in many different sizes, shapes, colors, and patterns. Your students have probably observed many differences among the insects they've been observing. Now is the time for your students to unleash their imaginations and create some fantastic works of insect art!

•No one has ever seen a moon bug. In fact, most people doubt that moon bugs even exist. But you never know! Since none have ever been seen, nobody knows what they look like. Moon bugs may have wings, spines, eyes, tails, stripes, or spots -- who knows? Ask your class to imagine what this insect might look like. Students can draw their conceptions on activity sheet 5 or use egg cartons and art materials to make their Moon Bug.

•Lots of people see butterflies every day. Your students can make their own butterflies from pipe cleaners and pieces of colored paper. The large pieces should be 8" x 8" and the small pieces 4" x 4". Starting at one corner fold the paper across the diagonal like a fan.





Tie the two folded pieces together with a pipe cleaner. Spread out the wings and make antennae. You now have

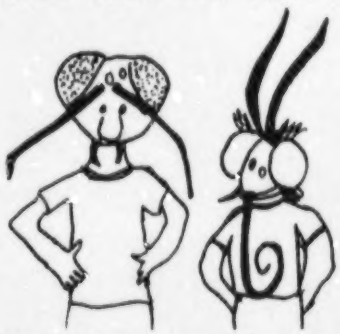
a beautiful butterfly! Students can hang some of the insects from the lights and hide others in places with good camouflage.*

*adapted from Heath Science (Level 4 -- Teacher's Edition, p. T39C), 1981 and reprinted by permission of D.C. Heath and Company.

5. Want to Keep Going?

If your class is still buggy about insects, here are some extra projects to do. Your students can:

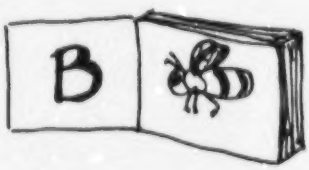
- Make insect costumes and wear them to a school Halloween party.



- Listen to the works of insect-inspired composers! Discuss the insects suggested by the following music -- "Flight of the Bumblebee," Nicolas Rimsky-Korasakov; "Dragonfly," Joseph Straus; and "Dance of the Mosquito," Anatol Liadov.

- Use a hand lens to look at a newspaper photograph and the corner of a turned on TV screen. This shows students how an insect's compound eyes break down pictures into dotted or lined patterns.

- Make insect amplifiers by placing house flies in paper cups and rubberbanding pieces of wax paper over the mouths of the cups. What do your students hear when they place the cups against their ears?



- Think of an insect for every letter from A-Z and illustrate an alphabet book.

- Draw a circle on the sidewalk or blacktop with some chalk. Put a couple of quick crawling insects in the middle. Which insect "races" to the finish line first?

6. How About a Little More Help?

The following two pages will provide you with a little more assistance in directing your budding young entomologists. The first page contains complete instructions for making an insect net. You might make one, or you may have some parents who are interested. Insect nets can be purchased at toy or hobby stores, but we won't discourage a resourceful do-it-yourselfer!

The second page is a very simple insect key. There are literally hundreds of thousands of different insects. All are grouped into 26 orders. An order is a large group of insects with similar characteristies. Butterflies and moths, for example, all belong in the same order. Most insects you will find are in one of the orders represented on this key. If you need more help check the reference section.

Congratulations! You've just caught a glimpse of the interesting world of insects! Through your efforts, your students have observed intricate life cycles and fascinating adaptations. They can now better understand the role and importance of these animals in our environment. So, put down your net and take a big bow!

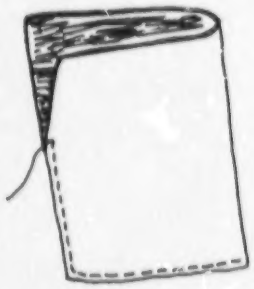
Making an Insect Net

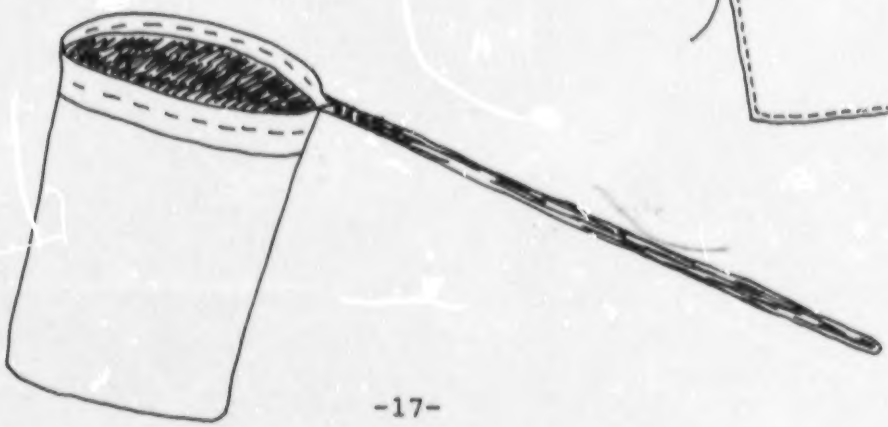
For each net you will need:

- a three-foot piece of broom handle, dowel, or stick
- a wire coat hanger
- strong tape
- old lace curtain or nylon net
- strip of cotton fabric

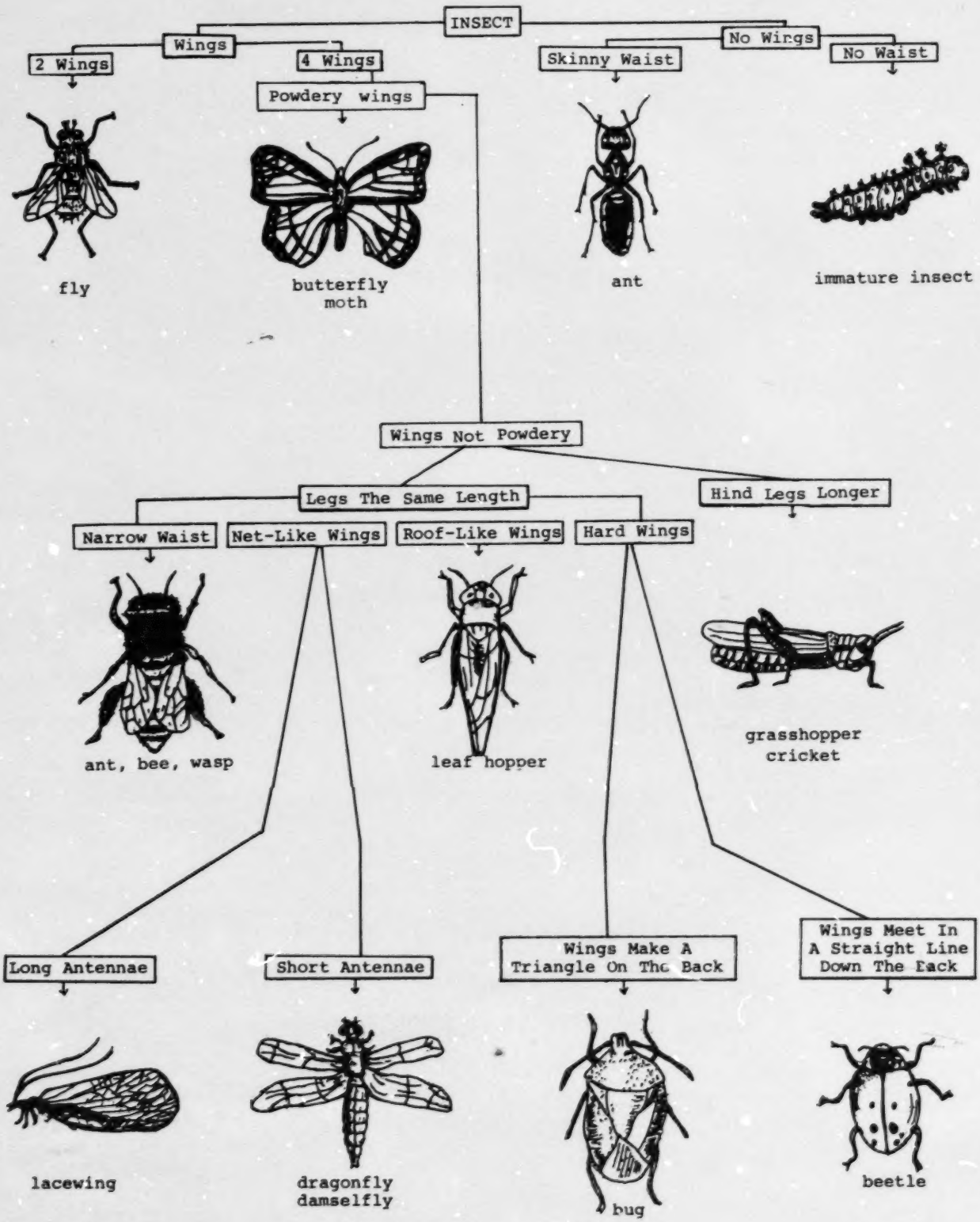
1. Straighten the hook on the hanger.
2. Bend the rest of the hanger into a circle.
3. Tape the handle to the straightened hook. Wrap the tape around the handle and hook several times for strength.

4. Measure the wire circle. Add two inches to this measurement and cut the lace or nylon net to this width. Cut the piece 24 inches long.
5. Sew the two 24 inch sides together, and sew one end of the bag shut.
6. To make a strong net, sew a 3 inch strip of cotton fabric to the top of the bag, turn the cotton over the wire loop, and sew the cotton back on itself so the bag is attached to the wire.





A Simple Insect Key



Name _____

No one believes in moon bugs -- except you. You saw a moon bug one night when you were alone in your backyard. Draw it on this page. Then show your picture to someone.

Activity Sheet 5
Moon Bugs and Butterflies

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*These books are available at the Jackson District Library. Similar titles may be found at the Library's 16 branches under the same Dewey Decimal numbers.

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At REMC...

The Jackson County Intermediate School District's Regional Educational Media Center has the following:

Motion Pictures:

"Bees - Backyard Science"	MP 96
"Beetles - Backyard Science"	MP 97
"Big Green Caterpillar"	MP 601
"Biography of a Bee"	MP 602
"Cicada - The Insect Methusela"	MP 640
"Crickets - Backyard Science"	MP 270
"Life Cycle of a Wasp"	MP 2183
"The Monarch Butterfly Story"	MP 1882
"A Night Out With Mr. Toad"	MP 1901
"Some Friendly Insects:	MP 1725
"Visit to a Honeybee Farm"	MP 1664
"Worms to Wings"	MP 2119

Other:

"Battle of the Bugs" a filmstrip and a cassette	KJ 52
"Butterflies and Moths" a book and a cassette	SE 1848.1
"Hidden World" a video cassette	VC 69
"I Can Read About Insects" a book and a cassette	SE 3644.1
"Insects" a video cassette	VC 75
"Ladybug" four readers and a cassette	SE 822
"Living Things Kit D: How Insects Live and Grow" 15 readers and 2 filmstrips	SE 2407
"Some Cycles" large pictures of butterfly life cycle stages	SE 1389

The Interesting World of Insects
First Grade Field Trip

Formal Objectives

Students will:

- differentiate insects from other animals by pointing out their body parts.
- learn more about insects by discovering them in the natural and built environments.
- demonstrate the correct use of an insect net by using one to catch insects.
- discriminate among different types of insects by pointing out their distinguishing characteristics.

Informal Objectives

First graders will be given the opportunity to:

- resist bug-squashing impulses and develop a positive interest in insects.
- use a magnifier to observe the beauty of insects.
- learn why it's important to release insects at the end of a field trip.

Indoor

1. Welcome the group. Introduce yourself, any co-DEECANS or staff, and the Dahlem Center.

2. Review insects with children. The first graders should already know:

   - what makes an adult insect special:
     - 3 body parts
     - 3 pairs of jointed legs
     - 1 pair of antennae
     - both simple and compound eyes
     - usually 2 pairs of wings
   - the life cycle stages of insects
     - 3 stage: egg, nymph, and adult (e.g., grasshopper)
     - 4 stage: egg, larva (caterpillar), pupa (cocoon or chrysalis), and adult (e.g, butterfly)

SE045115

•ways insects are beneficial and harmful

beneficial -- honey and silk makers, pollinators. pest controllers, fish bait, animal food, decomposers, experimental animals for genetic and stream quality studies.

harmful -- biters, stingers, crop eaters, disease spreaders, house pests, food contaminators

3. Review the parts of an adult insect in detail by dressing a student volunteer as a moth. Don't forget:

•the legs -- All adult insects have six legs. To demonstrate this, ask the volunteer to kneel and lean forward onto his/her hands. His/her hands represent one pair of legs and his/her legs another.
-- Safety pin a pair of stuffed knee socks to the volunteer's shirt to that s/he has a third pair of legs.

•the wings - Most insects are like the moth in that they have two pairs of wings. Flies possess only one pair. Other insects, like the walkingstick, lack wings altogether.
- Dress the volunteer in colorful moth wings which are attached to suspenders.

•antennae -- All adult insects have one pair of antennae. Besides using these "feelers" for touch, an insect may use them to taste, smell, and hear. Whereas butterflies have thin antennae with knobs on their tips, moths have knobless thread-like antennae or feathery antennae.
-- Place the hairband holding the "antennae" onto the volunteer's head.

•compound eyes -- Compound eyes are composed of thousands of hexagonal facets. These special eyes form mosaic images, detect movement, and distinguish various wavelengths of light.
-- Have the volunteer don the pair of sunglasses with the bottle caps glued to it.

•simple eyes - Many insects have 2-3 simple eyes to help them distinguish light from dark and perhaps to detect crude images at close range.
- Place a small round sticker between the volunteer's eyes.

•mouthparts -- Different types of insects have different kinds of mouths. A grasshopper, for example, has chewing mouthparts. A butterfly has siphoning mouthparts and a flea, piercing and sucking mouthparts.
-- Place a party favor blowout in the volunteer's mouth and ask him/her to sip some nectar!

4. Point out some insect homes -- the bald face hornet's nest, wasp's nest, honeybee hive, and some galls.

Most insects live inside plant galls. Galls are abnormal plant swellings that are caused when insect eggs laid in the plant hatch. The presence of the young insect disturbs the plant to that it can no longer grow in the normal way. Inside the swelling, the insect grows and eats. When it changes into an adult, it emerges from its protective home. Galls come in many shapes and sizes and can occur on buds, leaves, stems, flowers, bark, and roots.

Goldenrod ball galls and bunch galls are found at the Dahlem Center. So are wild cherry galls and oak button galls.

Goldenrod Ball Gall is the home of the peacock fly or its parasite

Goldenrod Elliptical Galls are formed by a moth.

The red bumps on wild cherry leaves shelter laurel midges through early summer.

Invite the students outside to search for insects and insect homes with you.

Outdoors:

1. Distribute insect nets to each student and teach students how to use them. Swing the net back and forth as if you were sweeping a broom over and through the grass to scoop up insects.

2. Take along a collection of jars and vials for the insects.

3. As you walk to the field near the dug pond, challenge students to look for insects and insect homes. Remember to stop at the anthill and to overturn a rotten log. Don't forget to return it to its original position before you leave. Can you see any dragonflies on the dug pond boardwalk? Then stop at an open place in the field.

4. After allowing enough time to catch and observe a variety of insects, have each student jar, vial, or box his/her favorite specimen. Then lay out a piece of cloth with insect bingo game side up.

   Challenge the students to "fill in" all the Bingo squares by setting their container on the appropriate square. Kids who can't catch an insect ought to be able to find a gall!

   When all the squares are filled, congratulate your winners and pass the jars around for a closer inspection.

5. When you arrive at the arboretum, ask the children to return their nets and containers to their proper place in the pavilion. Then ask students to sit in a circle and share what their favorite part of the field trip was.

   If the ground is dry and there's time, play "Caterpillar." Have everyone lie side by side on their stomachs. (Make sure smaller children are positioned between larger children.) After everyone has squeezed together as closely as possible, ask the person on one end of the line to roll over and onto his/her neighbor and to keep rolling across all the bodies. When s/he gets to the end of the line, s/he should lie on his/her stomach. Then the new "leader" should begin rolling.*

*New Games, Andrew Flugelman, ed., p. 117